BeamSquared® Readme

Contents

- Section 1 - Change log
- Section 2 - Errata and Workarounds
- Section 3 – Application Notes

Section 1 - Change log

- V2.7.0 12/9/2024
    - The Motion Utility will now close upon launching BeamSquared to free up a connected BeamSquared device.
    - Renamed M2.Automation.AutomatedBeamSquared.AttenuationControl automation property. This is a breaking change. Automation clients need to be updated and rebuilt.
    - Fixed issues that displayed the 3D caustic in reports incorrectly.
    - Fixed an issue that caused an error message to display when launching the BeamSquared Motion Utility.
    - Camera and BSQ serial/model numbers will now show in logged/exported reports.
    - Display statistics will now show in logged/exported reports.
    - Added support for camera SP1203.
    - Rail position and Attenuation can now be adjusted in incremental steps with BeamSquared and the Motion Utility.
    - Laser and After Lens results now only display ISO labels when caustic data meets ISO requirements.
    - Fixed an issue where loading a file could display the beam width basis incorrectly in the Measured Caustic Display.
    - Added the Extremal Ellipticity result.
    - Added checkbox to the Options page that disables unsaved run message prompts.
- V2.6.0 9/29/2023
    - Added BeamSquared Motion Utility application.
        - This utility allows standalone computer control of the BeamSquared motion system. Only the Motion Utility or the BeamSquared

application may control the motion hardware at one time.
    - Changed the Aperture to use the same enhanced Auto Aperture algorithm as used in BeamGage.
    - Added Support for Windows 11 64 bit.
    - Added support for camera SP204.
    - Added ability to change camera exposure in the Automation Interface.
    - Added a warning if the table setting have been reset to default values.

- V2.5.2 12/20/2019
    - Returned the IARailControl.Position automation property to previous functionality.
    - Added the IARailControl.PositionSet automation property to support manual mode runs with custom rail hardware.

- V2.5.1 11/20/2019
    - Fixed a critical issue introduced in v2.5 where the physical offset of the camera mount was applied twice to all z-Location values and resulting mirror stage movements.
        - We recommend all users of v2.5 discontinue its use immediately and discard all copies of the v2.5 software installation.
        - The resulting error affects all data collected and saved in v2.5 causing errors in the following results:
            - Laser Results : Divergence, Waist Width, Waist Location, Rayleigh Length, Astigmatism, and Asymmetry
            - After Lens Results: Waist Location
        - This release will automatically identify and compensate for this error in all bsqData files which were saved in v2.5. Loading a v2.5 data file and then manually saving the data again will update the data file to no longer be affected.
    - Added the following features to the automation interface to support automation of BeamSquared runs in Manual Mode.
        - UltracalVerifier (interface via AutomatedBeamSquared)
        - AutomationUltracalVerifierEvents OnStatusChange event
        - AUltracalVerifierStatus enumeration
    - Fixed the RailControl.Position property in the automation interface to properly allow setting of the current position of an external rail for Manual Mode.

- V2.5 8/15/2019

- Calibration settings for the connected BeamSquared device can now be viewed in the Table Info section of the Table tab.
- Calibration settings for the currently inserted lens can now be viewed in the Lens Info section of the Table tab.
- Calibration settings for the BeamSquared device and currently inserted lens are now stored with collected data and can be viewed as results by enabling them via the "Hardware Settings" group in the Results window.
- Raw frame data can now be stored as an encoded and compressed TIFF image inside the '.bsqdata'. The data is stored using the Gray32Float pixel format.
- The enhanced auto aperture introduced in BeamGage 6.15.1 is now used when measuring beam widths during a run, improving detection of small beams.
- Automatic outlier removal can now be toggled from the Measured Caustic Display toolbar. This setting persists with data and is non-destructive.
- A new automatic ISO setup is now available within the run setup wizard that will attempt to create a run configuration that will produce an ISO result.
- The Reports/Logging tab has been renamed to Data in order to be consistent with other products. Both logging and data export are now available in the Data tab.
- Fixed an issue that caused a data server to keep running and crash when reloading the application.
- Improved the reliability of frame collection from the XC-130 InGaAs camera.
- Fixed an issue that caused the application to crash when the temp directory had too many files.
- Statistics have been re-added to exported reports.
- Results no longer change when viewing a completed, unsaved run and either disconnecting from, or removing the lens from a connected device.
- Improved the BeamSquared inititalization process to not change calibrated settings in the event of a failure to verify existing settings.
- Improved the reliability of the PDF report export capability, reducing the possibility of a crash.

- V2.4.2 08/03/2018
  - Maintenance release to correct application crash when changing Beam Width Basis through either user interface or automation.
  - Added a section in the User Guide to explain how to deal with “ghost

beams" during setup and alignment.

- v2.4.1 05/25/2018
  - Maintenance release to correct inability to license for PyroCam demo units.
  - Removed the 10ms lower exposure limit on SP300 and SP920 cameras.
- v2.4 04/25/2018
  - Upgraded FlyCap camera driver to 2.12.2
- v2.3.1 3/30/2018
  - Fixing stability issue.
- v2.3 02/27/2018
  - Added detection of general astigmatic (twisted) beams. New Twist result is added and available through automation.
  - Corrected Positional Stability calculations.
  - Added SP-920 camera for reduced blooming in NIR wavelengths.
  - Added Smearing Correction option in setup options. Corrects for camera smearing artifacts in the beam image in the NIR wavelengths. This setting is also available through the automation interface.
- v2.2.1 12/08/2017
  - Adding support for the SP920.
- v2.2 09/13/2017
  - Upgraded PGR drivers to 11.164
  - Upgraded Pleora drivers to 4.1.7.3988
  - Added Pointing Stability Window and corresponding results
  - Gain control removed
  - Exposure for SP300 is limited to 10 – 400 ms to reduce smearing and uncertainty in the M2 measurements.
  - BeamSquared installation is not allowed if M2-200s is on the machine.
  - Attenuation algorithm improved to prevent continuous adjusting.
- v2.1 4/24/2017
  - New step table measurement method allows for customer selectable measurement positions
  - New 3D slice display

    - New Automation interface to support automating a BeamSquared unit
    - New caustic chart added to report
    - 3D display added to report
    - Hidden result groups no longer show up in the report
    - Improved caustic display to be more readable
    - Result ordering changed within groups to bring most important results to the top
    - Fixed issue where the attenuation would continuously be increased and decreased unnecessarily
    - Real time mode is stopped if the user changes the rail position or the attenuation
    - Fixed issue where some UI controls were disappearing
    - Improved Ultracal check to properly detect when an Ultracal is required
    - Abort/Finish buttons added to the Run ribbon bar and Live Playback/Start Run buttons added to the quick access bar for more convenient access.
    - Improved Ultracal verification algorithm to better ensure good measurements
- v2.0 12/23/2016
    - Added support for BeamSquared automated hardware unit
    - Added support for SP300 and Xeva XC-130 cameras
    - Now calculates statistics from multiple runs
    - Added real time mode to calculate M2 using the width at the focal length
    - data can now be logged during runs (including statistics from multiple runs)
    - Data can be exported after a run has completed
    - The cursor was changed to stick when manually moved (unless in a run). When in a run, it still moves to the centroid.
    - User can now select to display results in scientific notation or not.
    - New Logo
    - The default screen layout was changed
    - Default theme colors changed
    - Improved startup time and progress is shown on splash screen when starting
    - Camera Information (pixel pitch, bit depth, and frame size) added to results
    - Option added to ignore misaligned beam in a frame
    - Report improvements including statistics from multiple runs

- v1.0 03/18/2016
    - Initial Release

Section 2 - Errata and Workarounds

We're working hard to find and eliminate all the bugs in this software product. However, as of this release we still have a few bugs for which we have not found complete solutions. The following list details these bugs and offers recovery and work-around methods:

- No known blocking issues at the time of this release.

Section 3 - Application Notes

Supported Operating Systems

- Windows 10 (64-bit)
- Windows 11 (64-bit)

Documentation

A PDF version of the Operator's Manual is included with the installation. You must have a PDF reader installed (such as Adobe Acrobat Reader) in order to view this file.

Installation

- It is recommended that all users are fully updated to the latest Windows Updates. If all updates are not applied to your system this may cause problems with BeamSquared. Of particular note is .NET Framework 4.5, which is required for BeamSquared to run. If not installed on the system already, then it will be installed prior to the installation of BeamSquared. This update is included as part of Windows 10.
- To install BeamSquared software you must have Administrative privileges.
- For maximum performance a dedicated video card is recommended over on-motherboard video outputs.

Troubleshooting and Reporting Bugs

If you suspect you have found a bug in our software please help us identify it by sending the following information to service.ophir.usa@mksinst.com.

1. A description of the actions that reproduce the problem.
2. The .bsqSetup or .bsqData file you were using at the time.
3. All files (if any) in the directory C:\ProgramData\Spiricon\BeamSquared\Logs.
4. All files (if any) in the directory C:\ProgramData\Spiricon\DataServer\Logs.

The more information you can provide, the more likely we can reproduce it in our lab, and fix it.